

the old school of physical experimenters who lacked that most important helper to their investigations—the knowledge of mathematics, but made up for this deficiency through a sort of intuitive perception when, led by a certain imaginative or creative faculty, they were able, with a sure hand, to grasp the very essence of a physical phenomenon.

With the present tendency of physical researches, this class of learned men could scarcely hold their ground; but, on the other hand, we must not disdain these mere experimenters, for they count among their number no less a man than the great Faraday.

AUGUSTUS HELLER.

NOTES.

THE adoption of the metric system by the United States seems to have received a notable impulse during the present week by the action of the Committee of Congress, which has reported in favour of its use by the United States Government in all its affairs except the completion of land surveys now in progress, on and after July 1, 1898, and its general use throughout the country on the first day of the twentieth century, January 1, 1901. The report is the outcome of a movement very early in this Session of Congress.

IN accordance with a resolution of the House of Assembly of Cape Colony, carried last year, a Commission, consisting of the Hon. J. X. Merriman, Dr. Thomas Muir, Dr. David Gill, F.R.S., Mr. Thomas Stewart, and Mr. Charles Currey, has been appointed for the purpose of organising, controlling, and directing the work of geological exploration and survey in the colony. We are informed that the Commission has now appointed the under-mentioned gentlemen to begin the work of surveying and mapping the country:—Geologist, Dr. G. S. Corstorphine; Assistant Geologists, A. W. Rogers and E. H. L. Schwarz. As early as possible the Commission will publish and distribute a bibliography of South African geology.

It has been decided by the Huxley Memorial Committee to strike a medal for award by the Royal College of Science, London, and possibly for other purposes. The Committee desire to obtain the design for the medal, if possible, by competition. Further particulars will be furnished on application, which must be sent in before May 1 to the Honorary Secretary of the Huxley Memorial Committee, Prof. G. B. Howes, Royal College of Science, South Kensington, S.W.

WE regret to see the announcement of the death of Mr. Charles Chambers, F.R.S., Director of the Colaba Observatory. For the following particulars of his career, we are indebted to a long notice in the *Times* of India. Mr. Chambers was born at Leeds, Yorkshire, on May 30, 1834, and was consequently at the time of his demise in his sixty-second year. After finishing his education in his native place, he secured an appointment in the Kew Observatory, which he left in October 1863, to take up the post of assistant to the Director and Chief Superintendent and Electrician of the Indo-European Telegraph Department, Persian Gulf Section. In October 1865, he was temporarily appointed Superintendent of the Government Observatory, Bombay. After acting in that capacity for over two years he was confirmed in the appointment in January 1868, and continued to hold that office till November 1886, when he was given the appointment of Director of the Colaba Observatory, which office he was holding at the time of his death. He was elected a Fellow of the Royal Society in 1869. He was also appointed a Fellow of the Bombay University in 1872, and a member of the Syndicate of the same University from 1879 to 1890. His contributions to scientific literature were very

numerous, most of them being records and discussions of meteorological and magnetic observations in relation to solar changes.

PROF. N. A. MOOS, of the Elphinstone College, Bombay, has been selected for the post of Director of the Government Observatory at Colaba, in succession to the late Mr. Charles Chambers.

THE Annual Congress of the British Institute of Public Health will be held in Glasgow, from July 23 to July 28.

DR. SAMUEL WILKS, F.R.S., was elected President of the Royal College of Physicians of London, at a meeting held on Monday.

PROF. WYNDHAM R. DUNSTAN, F.R.S., has been appointed Director of the Scientific Department of the Imperial Institute, which has hitherto been under the direction of Sir Frederick Abel. The principal work of this Department is to investigate new or little-known products from India and the Colonies, and to advise in reference to their commercial utilisation. Already much valuable work has been accomplished in this direction. With the aid of an increased grant from the Royal Commissioners of the 1851 Exhibition further additions to the staff of the Department will be made, and the Laboratory, which was fitted up in 1894 with the assistance of a grant from the Goldsmiths' Company, will now be considerably extended.

THE College of New Jersey at Princeton is preparing to send an expedition to Patagonia for the purpose of securing fossils and large game. At a recent meeting of the Board of Trustees of the College, it was decided to change the charter name to Princeton University.

A FEW days ago M. Eugène Fariot, an engineer of some repute and a worker in aeronautics, one of the siege aeronauts who escaped from Paris in the *Louis Blanc*, died at the age of sixty-eight. He has bequeathed a sum of £4000 to the Société française de Navigation Aérienne, of which he was a member. One half of this sum is to pay the expenses of experiments, and the other half to be funded in the name of the Society; the interest to be expended yearly on its behalf. Consequently, it is expected that an end will be put to the long stagnation in scientific aeronautics in France, owing to the indifference of the public authorities for an art so popular in that country.

FOR more than twenty years, the Sunday Society has been working "to obtain the opening of museums, art galleries, libraries, and gardens on Sundays." As already noted in these columns, the House of Commons on March 10 passed, without a division, a resolution in favour of this object. We are glad now to record that in the House of Commons on Monday, in answer to Mr. Massey-Mainwaring, Mr. Balfour said: "The Government are prepared to open South Kensington and Bethnal Green at a very early date—indeed, almost immediately. Those are museums under the control of the President of the Council. The National Gallery, the National Portrait Gallery, and the British Museum are in the hands of trustees, and correspondence is still going on between the Government and the trustees, though I have no reason to believe that any difficulty need be apprehended as to the final conclusion of a satisfactory arrangement." In fulfilment of this promise, it was announced yesterday that the South Kensington Museum, including the India Museum and Science Collections in the Galleries on the west of Exhibition Road, as well as the Bethnal Green Branch Museum, will be open on Sunday next at 2 p.m. and will remain open till dusk.

AN instructive case for the consideration of anti-vaccinationists is reported in Wednesday's *Times*. It appears that the guardians

of the Gloucester Union have for some years persistently neglected to perform their statutory duty under the Vaccination Acts, with the result that they now find themselves responsible for one of the most appalling outbreaks of smallpox which has for a long series of years visited any provincial town in England. During the last seven weeks, the notifications of fresh cases of smallpox in the cathedral city of Gloucester have enormously increased, the number of new cases during the past week being no less than 154, and the disease is still rapidly spreading. The guardians are now endeavouring to stem the disastrous torrent they have let into Gloucester by their non-compliance with the laws of vaccination. About a week since they decided to attempt to undo the mischief of past years by passing a resolution deciding to enforce the compulsory clauses of the Vaccination Acts. It may be stated that the Town Council of Gloucester from the first have done their utmost by isolating the sick in hospital, by disinfecting houses, burning clothes and bedding, and placing relatives of sick in practical quarantine to stay the outbreak. Finding the outbreak gaining, they built extra hospitals, and have now hospitals for 120 patients, but the disease has continued to spread with such virulence that it is quite beyond their power to cope with it. A significant fact is that out of 90 deaths that have occurred in hospital up to March 27, 74 are among unvaccinated persons.

INDIVIDUAL enterprise is not often lacking in British commercial circles. Mr. R. K. Douglas gives an instance of this in the *Times*. He states that the Blackburn Chamber of Commerce have inaugurated a subscription, which now amounts to between £2000 and £3000, to provide sums for the purpose of sending out a commercial expedition to China, whose duty it will be to report on the state of trade in the interior of the country, the price of foreign goods in the native markets, the kinds of goods in demand, and the products and capabilities for trade of the inland districts. So far no assistance has been asked from the Government, and none has been given. But a point has now been reached when that modicum of official support which is necessary to the success of the expedition should be confidently asked for and promptly granted. Mr. Douglas is undoubtedly right in pointing out that if the expedition is not to prove a failure, the Foreign Office should supplement the efforts of the Blackburn Chamber of Commerce by giving it tangible support, and by appointing a member of the Consular Service in China to accompany the expedition on its travels. There should be no difficulty in doing this, and we hope with Mr. Douglas that the Government will give support to an undertaking which has for its important object the further promotion of British trade in the Far East.

WRITING with reference to the aurora of March 4, it was suggested by Dr. M. F. O'Reilly, in our issue of March 12, that possibly Röntgen effects might be produced by auroral light. Mr. Donald S. Munro sends us a cutting from the *Glasgow Evening News*, in which he describes an experiment made to test this point. He says: "I put a rapid isochromatic plate in a camera slide, and covered the slide with black paper wrapped round several times, in case of any possible want of tightness in the slide. Several circular and triangular pieces of sheet-iron were placed beneath the paper, and next the lid of the dark slide. On developing, the result was no image. Perhaps, however, some one trying again with a brighter display and a longer exposure might get a result. I did not think of the experiment until the northern lights were beginning to fade, so my plate had only half an hour's exposure."

STATISTICS relating to the harvest gathered in from the sea around the coasts of the United Kingdom during 1895, are given in a return made to the Board of Trade, and published as a

Parliamentary Paper. The statistics relate mainly to fish landed on the coasts of England and Wales, but summarised statements are also given of fish landed on the Scotch and Irish coasts. For purposes of comparison the statistics are given of the sea fisheries of Norway, Holland, France, and Canada. As regards England and Wales, the total value of the fish landed was £5,438,000. The corresponding values for 1893 and 1894 were £5,171,000 and £5,291,000 respectively. For Scotland the total value was £1,830,000, and for Ireland £269,000. In Scotland, during the year 1895, there has been a slight decrease in the quantity and an increase in the value of the fish landed as compared with 1894. In Ireland there was a decrease, both in quantity and value. The aggregate value for the United Kingdom during the year 1895 is £7,537,000, as compared with a total value of £7,260,000 in 1894. The figures for other countries during 1895 are not to hand, but for 1894 the values were:—Norway, £1,272,000; Holland, not accurately known, but probably less than Norway; France, £4,681,000; and Canadian Dominion, £4,317,000.

THE report of the Departmental Committee appointed by the Board of Agriculture to inquire into the etiology, pathology, and morbid anatomy of swine fever has been issued as a Blue-book. The following conclusions are stated therein: (1) Bacteriological investigations prove that the cause of swine fever is a specific microbe. (2) Experience and observation prove that swine fever (both in its acute and chronic forms) is communicable from diseased to healthy swine by contact, and also by the agency of persons, animals, and substances which are capable of conveying the infective matter. (3) It has been shown that the pronounced symptoms which have hitherto been looked upon as essential to a correct diagnosis are not always present in the early stage of swine fever, and are almost constantly absent in the chronic form of disease. (4) The Committee regard it as an important outcome of the study of the morbid anatomy of the disease that some animals undoubtedly infected with swine fever presented only minute erosions in the intestinal canal, and that other animals, which had been suffering from either the acute or the chronic form of the malady, but which had recovered, showed only depressed scars which were apt to be overlooked at any but a very thorough *post-mortem* inspection. (5) From the experimental evidence it is concluded that a condition of plugging of the crypts on the ileo-cæcal valve cannot be accepted as an indication of swine fever.

THE current number of *Weidemann's Annalen* contains an interesting paper by Herr Lang on the determination of the wave-length of Hertz electric waves. The method employed is similar to Quincke's method of measuring the wave-length of a musical note by arranging the lengths of two tubes which, starting from near the source of sound, are at their other ends brought together, so that the sound which has travelled along one tube interferes with that which has travelled along the other. Herr Lang uses an oscillator of Righi's form, consisting of two spheres. The tubes along which the electric waves have to pass are made of paper lined with tinfoil, and have a diameter of about 6 c.m. In order to detect the electric oscillations, a Branly tube (coherer) was employed. By placing a paraffin cylinder in one of the tubes the wave-length of the electric oscillation in paraffin, and hence the refractive index of paraffin, can also be measured.

THE "Handbook of Jamaica" for 1896 is filled with historical, statistical, and general information concerning the island. This present issue contains in an appendix a useful article by Mr. W. Fawcett, Director of Public Gardens and Plantations in Jamaica on the planting and care of woodlands.

A SENSIBLE little pamphlet, entitled "Health Notes for the Seaside" (Whitby: Horne and Son), in which some of the salient facts of the science of hygiene are applied practically to every-day life and holiday seeking, has been written by Mr. A. C. Dutt. The "Notes" contain much good advice on how to make the best use of a brief holiday.

MESSRS. G. PHILIP AND SON have sent us a copy of the special map they have had prepared to illustrate the British and Italian operations in the Eastern Soudan and Red Sea littoral. The map shows the entire course of the Nile from the great lakes to the sea, and the approaches to Khartum from the east coast. Another map published by the same firm, shows on a large scale the present scene of operations in Egypt.

THE fifth part of the second volume of the *Proceedings* of the Imperial University College of Agriculture, Tōkyō, is occupied by two papers, both in German, on Japanese trees in the winter state, illustrated by thirteen plates, and on the shrinking (*Klemmen*) of the Japanese timbers which are most useful for practical purposes.

THE "Hand-list of Coniferæ grown in the Royal Gardens, Kew," just issued, comprises 227 species, with 340 varieties. It has been drawn up with the assistance of Dr. M. T. Masters, and is preceded by a very valuable historical sketch of the nomenclature and classification of the *Abietineæ*, from the pen of Sir Joseph D. Hooker.

A KIND of German *Kew Bulletin* is announced, with the title *Notizblatt des königlichen botanischen Gartens und Museums zu Berlin*, under the direction of the staff of the Royal Garden and Museum at Berlin. It is to be devoted to the botanical interests of the German colonies, to the presentation of results which it is desirable to place promptly before those interested, and to the publication of new species.

WITH the view of bringing together the opinions of persons interested in reptiles, and with the laudable intention of educating people to a kinder feeling for these interesting creatures, *The Vivarium* has been started. The first number has been produced by a lithographic process, but the promoters hope to elevate the contributions to the dignity of print in the near future. The periodical is intended to be the organ of the newly-formed Reptilian Society, and copies can be obtained from the Secretary, Rand Rectory, Wragby, Lincolnshire.

A SIXTH revised edition of Prof. C. Gegenbaur's "Lehrbuch der Anatomie des Menschen" has been published by Engelmann, of Leipzig, in two ponderous volumes. The work was originally published in 1883, and took its place in the first rank among reference books of anatomy. The revisions ensure that the new edition will maintain the high position earned by the original. Another new edition, received during the past few days, is the seconds of "Geology and Scenery of Sutherland" (Edinburgh: D. Douglas), by Mr. H. M. Cadell. The book is a worthy example of a guide-book which has nature for its subject, and is a desirable companion for visitors to the rocky wilds of Sutherland. Would there were similar volumes for every county in the British Isles. Many instructive diagrams and full-page illustrations are distributed through the pages of the book.

THE Royal Agricultural and Commercial Society of British Guiana may not be progressing so much as it deserves, if progress is counted by an increased roll; but its admirable journal, *Timehri*, the December number of which (vol. ix. part 2) has come to hand, testifies to the existence of a healthy spirit of inquiry, which assists in the progress and development of the great colony with the affairs of which it is chiefly concerned. Among the subjects of papers in the present number are: "Food Adulteration," by Mr. L. M. Hill; "The Relation

of Boiling Temperatures in Multiple Evaporation," by Mr. F. I. Scard; "Ethnological Notes from Pirari," by Mr. C. A. Lloyd; "The Materials of the Urali Poison," by Mr. J. J. Quelch; "Some Guiana Parrots," by Mr. C. A. Lloyd; and two articles by the editor, Mr. James Rodway—one on the future of the Negro, and the other on the old boundary of Essequibo. In view of the fact that Venezuela lays claim to the whole of Guiana west of the Essequibo, it is well to call attention to this article, in which Mr. Rodway shows the baselessness of such a claim. The London agent of *Timehri* is Mr. E. Stanford.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mr. S. C. Fisher; a Silver-backed Fox (*Canis chama*) from South Africa, presented by Mr. C. W. Southey; a Leadbeater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Miss E. S. Young; two Crowned Dricker-Boks (*Cophalophus coronatus*, ♂ ♀) from West Africa, received in exchange.

OUR ASTRONOMICAL COLUMN.

NEW VARIABLE STARS.—The *Harvard College Observatory Circular*, No. 6, announces that an examination of the Henry Draper Memorial photographs of stellar spectra by Mrs. Fleming has led to the discovery of fourteen new variable stars of long period, in addition to those previously announced. The spectrum of the fifth star in the following list is of the fourth type. All of the others have spectra of the third type, having also the hydrogen lines bright, and it was this peculiarity which led to their discovery. The variability has been shown by comparison of a large number of photographs, and the variation has been confirmed in each case by Prof. Pickering.

Constellation.	Designation.	R. A. 1900.	Dec. 1900.	Magnitude.		Date of next Maximum.
				Br.	Ft.	
		h. m.	° ' "			1896
Sculptor ...	—39° 16	0 3.6	—39 47	8.9	<12.1	May 25
Columba ...	A.G.C. 6135	5 15.6	—33 48	7.6	11.3	June 23
Canis Minor...	...	7 1.5	+9 1	10.3	<13.7	Sept. 11
Virgo ...	+5° 27.8	12 57.6	+5 43	8.8	9.7	...
Apus ...	...	14 59.3	—71 40	9.0	<11.4	...
Sagittarius ...	—33° 13.234	18 21.4	—33 23	8.2	12.3	July 2
Sagittarius ...	—19° 53.47	19 8.1	—19 2	9.7	11.1	...
Sagittarius ...	...	19 8.7	—18 59	9.9	<13.3	...
Pavo ...	...	19 39.5	—72 1	7.6	12.1	Aug. 29
Microscopium	A.G.C. 28038	20 21.8	—28 35	7.4	8.4	...
Pavo ...	...	20 47.2	—63 5	9.6	<12.3	...
Grus ...	—38° 15.044	22 19.9	—38 4	8.6	11.0	...
Grus ...	...	22 19.9	—48 57	7.2	12.3	May 10
Aquarius ...	—16° 6.379	23 47.1	—16 25	8.2	9.3	...

COMET PERRINE-LAMP.—The following is a continuation of Dr. Lamp's ephemeris of Comet Perrine-Lamp for Berlin midnight (*Ast. Nach.*, 3341):—

		R.A.			Decl.	Bright-ness.
		h.	m.	s.		
April	3	...	4 19	25	...	+42 4.7
	6	...	24	49	...	41 36
	9	...	29	45	...	41 10.6
	12	...	34	21	...	40 48.3
	15	...	38	39	...	40 28.4
	18	...	42	45	...	40 10.8
	21	...	46	39	...	39 55.3
	24	...	50	23	...	39 41.4
	27	...	53	59	...	39 29.0
	30	...	4 57	28	...	+39 18.0
						0.007

Mr. Joseph Lunt reports that on March 1, 2 and 3, the comet appeared as a circular nebulosity without tail, but with a bright central condensation, which very gradually faded away outwards. It was as bright as the nucleus of the great nebula in Andromeda, which it somewhat resembled, and was easily seen with a telescope of one-inch aperture. On March 9 the aspect of the comet was greatly changed, a bright stellar nucleus having developed; this was not centrally placed, and gave the comet a fan-shaped appearance.